UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,741	01/31/2006	Giorgio Macor	C22935	9743

324 7590 05/24/2011

BASF Corporation
Patent Department
500 White Plains Road
P.O. Box 2005
Tarrytown, NY 10591

EXAMINER	
HORNING, JOEL G	

ART UNIT	PAPER NUMBER
1712	

NOTIFICATION DATE	DELIVERY MODE
05/24/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

andrea.dececchis@basf.com
deborah.pinori@basf.com
sonny.nkansa@basf.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/566,741
Filing Date: January 31, 2006
Appellant(s): MACOR ET AL.

Qi (Chee) Zhuo, Ph. D.
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 15th, 2011 appealing from the Office action mailed October, 25th, 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The examiner has no comment on the appellants' statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellants' statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellants' brief.

(8) Evidence Relied Upon

6548121	BAUER ET AL	4-2003
4233130	BORDEN ET AL	11-1980
2004/0011288	AFFINITO	1-2004
6251963	KOHLER	6-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-6, 8-13, 15 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121) in view of Affinito (US 20040011288) in view of Borden et al (US 4233130).

'121 teaches a process for producing strongly adhering coatings on substrates, such as polymers. This method used varies depending upon what kind of layer is being deposited. The general process can occur under vacuum conditions and comprises: a low temperature plasma treatment is carried out on the substrate; one or more photoinitiators containing at least one ethylenically unsaturated group are applied to the substrate, and on such a photoinitator coated substrate, a layer is deposited. If a polymeric layer is desired, a composition including at least one ethylenically unsaturated monomer or oligomer [and preferably a photoinitiator, as seen in col 17, lines 49-55] is coated on the substrate and cured

by UV/VIS radiation [which '121 further teaches is to be considered between 250 nm and 450 nm **(claim 15)**, col 17, lines 52-55]. If a metal, half-metal or metal oxide is desired, that layer is deposited from the gas phase *while* the substrate is being irradiated with electromagnetic waves (col 1, line 50 through col 2, line 12). '121 does not teach repeating these steps to deposit first a polymeric layer and then a metallic layer.

However, Affinito is also directed towards a vacuum process for depositing monomer coatings on substrates and then polymerizing them [0002], such as by UV radiation [0019]. It also teaches that such coatings are useful for a wide variety of applications on a wide variety of substrates, including polymeric ones [0004]. It further teaches that in some of these applications, it is desirable to deposit more than one layer onto the substrate, specifically, depositing a polymeric layer (by depositing a monomer layer and crosslinking it) and then depositing a metal layer onto that polymeric layer [0047-0048], such as in the process of making electrochemical cells, where the monomer layer is deposited, crosslinked and then coated with the metal layer [0059].

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention performing the process of Bauer et al to first deposit a polymeric layer and then to deposit a metallic layer, since it was taught to be a useful combination of layers for a variety of applications, which would produce predictable results. In doing so, a person of ordinary skill in the art would perform a process that *comprises*: a low temperature plasma treatment to the polymeric substrate (step "a"),

depositing a photoinitiator sub-layer and a mixture of photoinitiators with monomers containing at least one ethylenically unsaturated group, to produce a sub-layer, producing an organic layer (step "b"), irradiating that organic layer to produce a polymeric layer (step "c") and depositing from the gas phase a metal layer (step "d"), so that the substrate is affixed to the irradiated polymeric layer which is affixed to the metal layer.

Furthermore,'121 does not teach what dosage of radiation should be used to cure their polymers.

However, Borden et al is also directed towards curing polymer composition coatings containing photosensitizers (abstract), it teaches that the radiation dosage used to suitably cure such coatings is a result effective variable for determining the degree of crosslinking required in the layer and will vary depending upon the polymer composition used. Since it teaches the dosage per gram of polymer composition, it is readily apparent that the thickness of the coating would also be variable when the dosage is represented as millijoules per centimeter squared (col 5, lines 57-66). Thus, it would have been obvious to one of ordinary skill in the art at the time of invention to choose the instantly claimed ranges of "1 to 1000 mJ/cm^2" through process optimization to produce the desired degree of crosslinking for a particular polymer composition deposited in a particular thickness, since it has been held that when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See In re Boesch, 205 USPQ 215 (CCPA 1980) **(claim 1)**.

Regarding **claim 2**, as mentioned previously '121 teaches performing an irradiation during the metal deposition from the gas phase through (col 2, lines 9-12).

Regarding **claims 3-6**, '121 teaches many different photoinitiators. The photoinitiator can be benzophenones **(claim 3)** (col 17, lines 49-67). The photoinitiator is preferably a subset of the formulas of **claim 4** (col 6 line 61 through col 7, line 8). In which (IN) is further preferably limited by a subset of the formulas of **claim 5** (col 7, line 9 through col 8, line 4). In which (RG) and (RG') are further especially preferably limited by a subset of the formulas of **claim 6** (col 8, line 65 through col 9, line 10). Additionally, example 1 teaches using a photoinitiator which meets the limitations of **claims 4 and 5** (col 23, lines 29-40).

Regarding **claim 8, 9 and 21**, '121 teaches an example 1 which exposes the substrate to plasma formed from a mixture of argon (inert) and oxygen (reactive) **(claims 8, 9 and 21).**

Regarding **claim 10**, '121 does not teach appropriate thickness ranges for their photosensitizer containing polymer layers. However, Affinito teaches that in such vacuum deposition methods thicknesses of 5-10000nm can be suitable thicknesses [0051].

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to deposit photosensitizer containing layers 5-10000nm in thickness, since they were taught to be suitable thicknesses for polymer layers to be deposited on such substrates. MPEP 2144.05 states: "In the case where the claimed

ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists.” **(claim 10)**.

Regarding **claim 11,** '121 teaches performing the application of the photoinitiator (step “b”) as soon as possible after the corona discharge treatment (process step “a”) and suggests doing so in a continuous process (col 15, lines 15-20). Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to perform step “b” immediately after step “a.”

Regarding **claim 12**, ‘121 teaches that the photoinitators can be used in combination with a solvent (col 15, lines 7-27), so materials other than photoinitiators are taught to be present in the composition. MPEP 2144.05 (II) states: "Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'"

Regarding **claim 13**, '121 teaches that the process allows a high throughput per unit time (col 1, lines 50-51). The examiner takes official notice that waiting time between process steps is a well known variable for determining the maximum throughput per unit time of a process. Decreasing the waiting times between processing steps, decreases the total time for the overall process and increases the maximum throughput of a process.

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to reduce the waiting times as much as possible and perform step "c" immediately after step "b" in order to allow for a higher throughput per unit of time as taught to be desirable by '121.

Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 6548121) in view of Affinito (US 20040011288) in view of Borden et al (US 4233130), as applied to claim 1 above, and further in view of Kohler et al (US 6251963).

'121 teaches that the photoinitators can be used in combination with a solvent (col 15, lines 7-27), but does not teach that the solvent is a liquid or what should be done with the solvent after the photoinitiator layer is deposited.

However, '963 is also directed towards depositing films of photoinitiators and teaches using liquid solvents with the photoinitiators in order to form a solution which is then deposited on the substrate (col 18, lines 31-48).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to choose to use a liquid solvent with the photoinitiator compositions containing a solvent of '121 as a known manufacturing option for depositing a film of a photoinitiator composition, which would produce predictable results **(claim 7)**.

Regarding **claim 14**, '963 teaches that after the substrate is coated with the liquid solution photoinitiator, the solvents are normally removed by drying (col 19, lines 29-31).

Thus it would have been obvious to a person of ordinary skill in the art at the time of invention to then dry the liquid solution after the layer has been deposited since it was recognized to be the normal procedure for such liquid solvent bearing coatings.

'963 further teaches drying the photoinitiator film at elevated temperatures (col 25, lines 51-52) and that it is advantageous to dry photoinitiators at elevated temperatures under a vacuum (col 4, lines 39-42). The use of a reduced pressure environment with the heating step would require that the coating be heated inside a vacuum chamber, which would be, by definition, an oven.

Thus it would have further been obvious to a person of ordinary skill in the art at the time of invention to dry the photoinitator coating at elevated temperatures under a vacuum in an oven, since it was known to the art to be an advantageous method for drying photoinitiators and would produce predictable results **(claim 14)**.

(10) Response to Argument

Appellant first argues that Bauer does not teach irradiating the first deposited layer until after a second polymer layer is deposited. That is one embodiment, while another is irradiating the first deposited layer with UV radiation *while* the additional metal layer is being deposited (col 1, line 50 through col 2, line 12). The difference between the claim and Bauer is that the claim requires irradiating the coating before depositing the metal layer, while Bauer does them simultaneously.

Affinito is also generally directed towards making film structures with a first polymer layer and then a metal layer on a substrate. The primary purpose of Affinito

does not need to be to increase the layer adhesion in order to be analogous art. It is in the same field of endeavor, making the same multilayered crosslinked polymer/metal coating structures. Affinito does not teach separating the metal layer from the polymer layer, so improved adhesion would not be against the teaching of Affinito, but rather improved adhesion is normally considered beneficial if the materials are to remain in contact. For example, it is readily apparent that it would be undesirable for the anode (metal layer) in the Affinito electrochemical cell to delaminate from the substrate (polymer layer coated) [0059]. If it did, it might contact the cathode and short the cell.

Appellant argues whether the first polymer layer of Affinito would be a primer coating, specifically arguing that though Affinito teaches that their layers can be primer layers that the particular polymer layer discussed in the rejection might not be a primer layer. However, it is a pretreatment layer on the substrate prior to depositing the metal layer; it will determine the properties of the substrate metal interface (including its adhesion), so it can be considered a primer layer. It is unclear what specific knowledge or priming (which is lacking) would be required by Affinito for the rejection to be proper. The claim does not even require that the polymer layer be a primer.

Affinito teaches that when depositing a first photoinitiator/polymer layer and then attaching a metal, crosslinking the polymer layer before depositing the metal layer is also a suitable way to make the film structure. What this indicates is that either order of these steps, cure while depositing the metal or cure then deposit the metal layer, was known to the art at the time of invention and was known to be suitable for forming these polymer/metal layered structures and does not produce unexpected or new results.

Consider In re Burhans, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results); In re Gibson, 39 F.2d 975, 5 USPQ 230 (CCPA 1930).

Appellant then argues that if it were obvious to combine Bauer and Affinito, then that combination would be expressed in a different way, performing steps a), b) and c1) of Bauer then depositing a metal layer onto the layer of c1). There is more than one way to express the teachings of Bauer and Affinito. The examiner agrees that this could be a good way to explain how the teaching of these references could render it obvious to perform a process that would read upon the claims. Another way might be to modify the process of Affinito, where a polymer layer is deposited, crosslinked and then coated with a metal layer to include the specific photoinitiators found in Bauer (in order to enhance crosslinking, and are compatible with the same polymers and metals of Affinito) which would then would be expected to use processing conditions similar to those used in Bauer to produce the desired layers.

In response to appellant's argument that the references fail to show certain features of appellant's invention, it is noted that the features upon which appellant relies (i.e., performing the process at normal pressure) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/JOEL G HORNING/

Examiner, Art Unit 1712

Conferees:

/Timothy H Meeks/

Supervisory Patent Examiner, Art Unit 1715

/Shrive P. Beck/

Quality Assurance Specialist, TC 1700